EMPLOYEE'S SAFE ACTS TOWARDS HEALTH AND SAFETY COMPLIANCE IN GHANA

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Abstract
The high incidents and accidents rate in the construction industry in Ghana has been attributed to the large number of Small and Medium-Sized Enterprises (SMEs) contractors. The purpose of the study was to examine employee's safe acts that contribute to Health and Safety (H&S) compliance among SMEs contractors. The study adopted Delphi survey method of data collection. Views of experts (construction professionals and academicians) were sought on safe acts of workers leading to H&S compliance. The questionnaires were completed by the experts, based on the impact of otther factors in predicting safe acts of workers towards H&S compliance. The ratings were based on either the impact was considered to be very high or high. Data obtained was analysed with Microsoft EXCEL, spread-sheet software and results were presented in a table and a chart. Findings from the study show that only three measurement variables (ensure equipment /tools are in good condition before usage, ensure the use of personal protective equipment (PPE) and ensure proper positioning of tasks) were considered by the experts to have reached consensus with Inter-quartile deviation (IQD) cut-off (IQD $\leq$1) score. It also indicates strong consensus with very high impact (VHI: 9.00-10.00). Nine other measurement variables also reached consensus with IQD cut-off (IQD$\geq$1.1$\leq$2) score, which indicates good consensus with high impact (HI: 7.00-8.99). The remaining four measurement variables reached consensus with IQD cut off (IQD$\geq$2.1$\leq$3) score. It can be concluded from the findings that employee's safe acts has a high impact on H&S compliance of SMEs contractors in Ghana. It is recommended that questionnaire survey instrument should be used among large construction firms to validate the measurement variables.

Keywords: Employee's safe acts, Compliance, Health and Safety, SME contractors

1 Introduction

Small and Mediun-Sized Enterprise (SMEs) contractors have dominated the construction industry in Ghana as indicated by Frempong and Essegbey (2006), Laryea (2010) Ofori and Toor (2012). Kheni, Dainty and Gibb (2007) posits that the domination of the SMEs has made it impossible for the SMEs to manage H&S effectively. Mustapha, Aigbavboa and Thwala (2015) in their findings from the study of the application of modified statistical triangle of accident causation in construction H&S indicated that construction accidents lead to delay in project completion, increase the expenses and ruin the reputation and reliability of contractors. These incidents have placed the construction industry among the industries with high rates of accidents, both permanent and non-permanent disabilities and even fatalities. Mustapha et al., (2015) posit that not all accidents are preventable since risk is beyond the human intervention and majority of accidents happen when employees disregard safety rules (unsafe acts) and

management ignore the presence of unsafe conditions. Employees must desist from acts such as, working under the influence of alcohol and other drugs. Appropriate use of PPE must be ensured by all employees whenever they are carrying out any task. The paper aims to examine employee's safe acts that will contribute to H&S compliance among SMEs contractors in Ghana. Employees' attitude towards H&S compliance in the construction industry has been discussed.

2 Literature Review

The employers and employees have similar perceptions of the respective responsibilities of each party for H&S in the workplace (Elgood, Gilby & Pearson, 2004) because H&S involves all levels of workforce, from the top to the bottom. Therefore, employees' involvement should be encouraged by management. It is important to establish participation, communication and trust between the various role players in order to create a positive safety culture **(**Boshoff, 2015). Smallwood and Haupt (2008) argued that compliance with OSH regulations brings about benefits not limited to avoiding direct and indirect costs (Windapo & Oladipo, 2012) also contributes to organisations' competitive advantages. According to Othman (2012) "inability to realise mechanical faults and inadequate training coupled with harsh work environment and unsafe methods of working *inter alia* are among the causes of non-compliance with OSH regulations in developing countries". Adenuga, Soyingbe, and Ajayi (2007); Idubor and Osiamoje (2013); Windapo and Oladapo (2012) supported this argument with lack of adequate training as a hindrance to OSH regulations compliance and further indicated that safe work environment can determine how issues of compliance with OSH regulations are taken care of by construction firms. Idubor and Osiamoje (2013) posits that adequate OSH training and education enhance the OSH performance e.g., compliance with OSH regulation. According to the Occupational Health and Safety (OHS) Act, the employer must, where reasonably practicable, provide and maintain a safe, healthy work environment that is without risk to employees (Boshoff, 2015). It is therefore, the duty of every employee at work to take reasonable care for the health and safety for himself as well as other persons. Every worker is in other words responsible to take care of his or her own health and safety. The unsafe acts of the worker may not negatively impact or endanger others (Boshoff, 2015).

One of the greatest determinants in workplace safety, especially as employees interact amid a host of varying safety issues is employers' behaviour. Elgood et al., (2004) argued that attitude is a key to understanding employee behaviour and prevention of on-site-job injuries. Therefore, it is the duty of employers' to educate their employees on the possibility of workplace injury before any safety program should be instituted (Schulz, 2004). Smallwood (2010) posits that employees' attitude relates to culture and can be linked to ignorance. If employees' attitude is checked it will lead to improvement towards H&S in the construction industry. Therefore, it is the responsibility of the employer on his employees to make provision a set of rules and regulations that relate directly to safety in the workplace to ensure the general wellbeing for employees (Elgood et al. 2004). The organization must undergo a culture change from the top and filter its way down to all employees for any sort of attitudinal change to occur to every employees (Schulz, 2004). Central to this culture is the feeling that safety is a top priority and nothing else. Employees' good attitude will contribute to their safe act which will finally lead to compliance of H&S in the construction industry. It is also the duty of employees' to co-operate with the employer where the OHS Act imposes a duty or requirement to be performed or complied with. Employees' should always carry out and obey lawful orders and obey the H&S rules and procedures laid down by the employer (Boshoff, 2015).

3 Research Methodology

Twenty (20) experts made up of academicians and construction professionals selected from Building Technologists, quantity surveyors were selected at random from West African Built Environment Research (WABER), International Conference on Infrastructure Development in Africa (ICIDA) and Applied Research Conference in Africa (ARCA) and invited during the initial stage of the study. The experts for the Delphi survey were selected for a purpose to apply their knowledge to a concept raised in the study based on the criteria that was developed from the research questions under investigation. A Delphi Study is a group decision mechanism requiring qualified experts who have deep understanding of the issues at hand (Okoli & Pawlowski, 2004).

Each expert was required to meet at least five (5) of the following minimum criteria: residency – have lived in any of the Metropolitan/Municipal/District in Ghana at least more than one (1) year; knowledge – has knowledge of H&S in the construction industry; academic qualification – has been presented an earned degree (Bachelors-degree/Masters-degree/PhD) related to any field, certification of employment/experience focusing on construction development or sustainable issues; experience – has a history of or currently performing consultation services for the government of Ghana, individuals, businesses, agencies, companies, and or organizations, relating to construction or other sustainable development. The experts must exhibit a high degree of knowledge of experience in the subject matter in addition to extensive theoretical knowledge, employment – currently serves (or has previously served) in a professional or voluntary capacity (e.g., at place of employment - institution, business, agency, department, company) as supervisor or manager of establish that is involved with construction or sustainable development in Ghana, influence and recognition - has served or currently serving as a peer reviewer for one or more manuscripts received from a journal editor prior to its publication in the primary literature, with focus of the manuscript(s) on construction or sustainable development, authorship - is an author or co-author of peer-reviewed publications in the field of construction with emphasis in Ghana, has prepared and presented papers at conferences, workshop or professional meetings focusing on construction, sustainable development and H &S, research - has submitted one or more proposals to or has received research funds (grant or contract) from national, local government, regional, and or private sources that support construction, sustainable development and studies related to H&S, teaching - has organised, prepared, and successfully presented one or more H&S or sustainable development training workshops focusing on the group for which expertise is sought. The workshop or course must have been on H&S practices or has served as an individual or as a collaborative instructor in the teaching of one or more Polytechnics or University courses focusing on construction, sustainable development or related field, membership -member of a professional body (as listed on the expert questionnaire). The expert should also be the representative of a professional body so that their opinions may be adaptable or transferable to the population and finally, willingness – Experts must be willing to fully participate in the entire Delphi survey. The selected expects for the paper represented a wide variety of backgrounds and guarantee a wide base of knowledge (Rowe, Wright & Bolger, 1991). Rowe et al., (ibid) recommendations were adopted for the current study. The number of respondents should be large enough to ensure that all perspectives are represented, but not so large as to make the analysis of the results unmanageable by the researcher (Linstone & Turoff, 1975). The adoption of five of these criteria was considered more stringent than the recommended number of at least two criteria by Rogers and Lopez (2002) and Dalkey and Helmer (1963). The five minimum criteria were framed after the four recommendations made by Adler and Ziglio (1996), with the inclusion of experts' residency status, which was considered to be compulsory for all selected experts. This was considered significant because experts were required to have a wide-ranging understanding of H&S practices within their locality.

From the twenty (20) experts invited to participate in the Delphi survey, thirteen (13) experts responded to participate and completed the first round, but only nine (9) experts remained throughout the study. This number of panellists was considered adequate based on literature recommendations from scholars which have employed the technique previously. Hallowell and Gambatese (2010) suggested that since most studies incorporate between eight (8) and sixteen (16) panellists, a minimum of eight (8) is reasonable. This was beyond the given limit in the current study. Hallowell and Gambatese (2010) argued that the size of a panel should be dictated by the study characteristics, number of available experts, the desired geographical representation and capacity of the facilitator. Experts were asked to rate the impact of other factors in predicting employees' safe acts in relation to their contribution towards H&S compliance as shown in Table 2. Data obtained from the survey was analysed with Microsoft EXCEL, spread-sheet software. The output from the analysis was a set of descriptive statistics such as means, median, standard deviations and derivatives of these statistics.

3.1 Instruction for experts

If the impact is considered to be high, then **'X'** should be marked under the '**7**' or **'8'** box depending on whether your opinion is inclined more towards high or very high impact. Please use your experience, expertise and judgement to rate what you perceive the average negative or positive influence of the various features are for H&S compliance and the Ghanaian SMEs contractors at large would be if the described elements were lacking or present.

Table 1. Impact scale

No impact		**Low impact**		**Medium impact**		**High impact**		**Very high impact**	
1	2	3	4	5	6	7	8	9	10

4 Findings and Discussion

From the sixteen (16) measurement variables or attributes drawn from literature and considered most relevant for the study as shown in Table 2, only three measurement variables or attributes (ensure equipment /tools are in good condition before usage, ensure the use of personal protective equipment (PPE) and ensure proper positioning of tasks) were considered by the experts to have reached consensus with Inter-Quartile Deviation (IQD) cut-off (IQD $\leq$1) score. This score implies the measurement variables have very high impact (VHI: 9.00-10.00) on employee's safe acts towards H&S compliance and indicates strong consensus. The results are in line with Mustapha et al., (2015), Othman (2012) and Elgood, Gilby & Pearson (2004) findings. Moreover, consensus was reached on nine other measurement variables with IQD cut-off (IQD$\geq$1.1$\leq$2) score. The IQD score indicates good consensus for the nine measurement variables and the impact on H&S compliance was high (HI: 7.00-8.99). Four measurement variables reached consensus with IQD cut off (IQD$\geq$2.1$\leq$3) score, which indicates weak consensus on the measurement variables and impact on H&S was medium (MI:5.00-6.99). These findings further, indicate similar pattern reported earlier by Boshoff (2015), Windapo and Oladipo (2012), Othman (2012) and Smallwood and Haupt (2008) which emphasized on the need for education and appropriate training towards employee's safe acts. Using the median as a means of reaching consensus, fourteen (14) attributes were considered to have reached consensus, with the exception of two measurement variables (avoid annoyance and horseplay at the workplace and do not service equipment that is in operation) which did not reach consensus as shown in Tables 2 and their representation in Figure 1.

Table 2. Employee's Safe Acts

Employees' Safe Acts	Median	Mean	SD	IQD≤ 1
Inspect workplace before commencing any activity	9	7.86	1.73	1.36
Tidy up workplace at the end of any activity	7	6.5	1.71	2
Use appropriate tools/equipment	8	7.57	1.5	2.25
Do not work under the influence of alcohol and other drugs	8	8.14	1.46	2.25
Do not smoke in flammable materials store	9	8.43	1.68	2.5
Ensure equipment /tools are in good condition before usage	9	8.14	1.36	1
Use correct proper lifting, handling or moving of objects	8	7.86	1.36	1.36
Ensure proper stacking of objects /materials in safe locations	8	7.57	1.4	1.07
Avoid annoyance and horseplay at the workplace	6	6.57	1.84	1.5
Ensure the use of personal protective equipment (PPE)	9	9	0.93	0.25
Do not remove safety guards from the workplace or equipment	8	7.87	1.25	1.25
Do not throw or accidentally drop objects from high levels	7	7.43	1.51	1.5
Ensure proper positioning of tasks	7	7.29	1.38	1
Do not service equipment that is in operation	6	6.14	2.61	2.5
Concentrate on the task at hand	7	7	2	2
Work in good physical conditions	8	8.29	1.5	2

M = Median; $\overline{x}$ = Mean; σx = standard deviation; IQD = Interquartile deviation

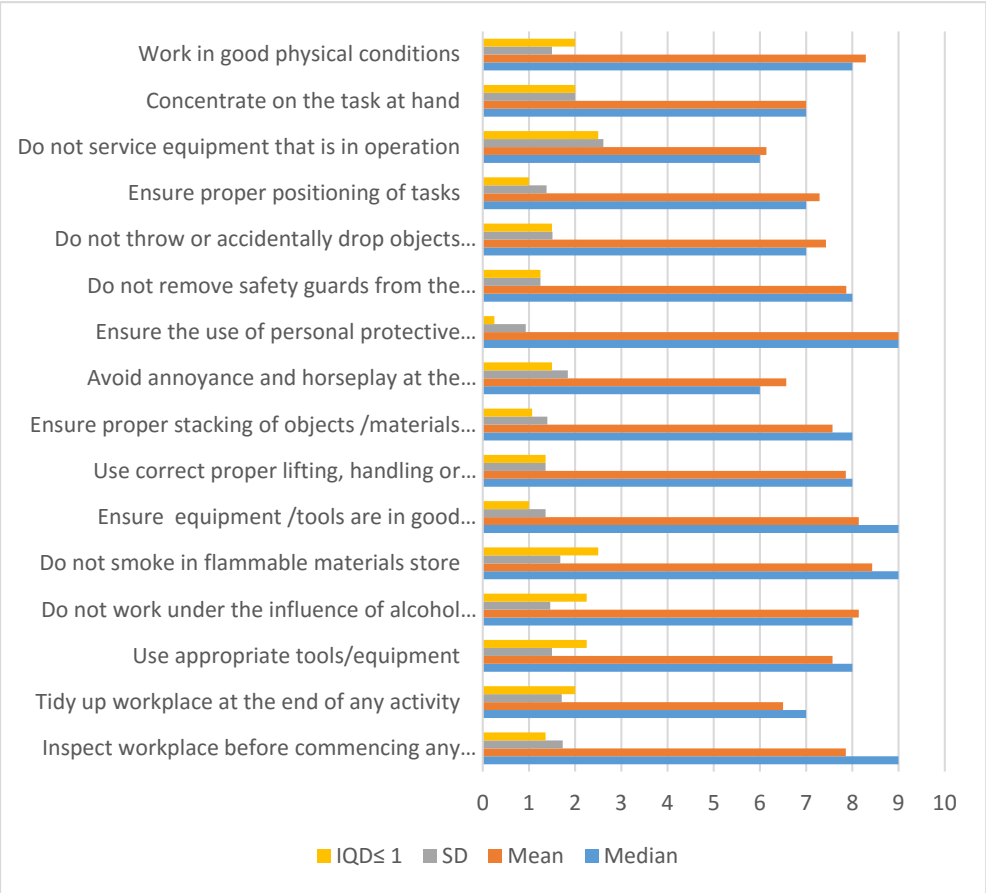

Figure 1. Employee's safe acts

Results from the study revealed that the following sixteen factors or measurement variables were considered by the experts to have varying impact on the employees' safe acts towards H&S compliance.

1. Inspect workplace before commencing any activity (HI)
2. Tidy up workplace at the end of any activity (HI)
3. Use appropriate tools/equipment (MI)
4. Do not work under the influence of alcohol and other drugs (MI)
5. Do not smoke in flammable materials store (MI)
6. Ensure equipment /tools are in good condition before usage (VHI)
7. Use correct proper lifting, handling or moving of objects (VHI)
8. Ensure proper stacking of objects /materials in safe locations (HI)
9. Avoid annoyance and horseplay at the workplace (HI)
10. Do not service equipment that is in operation (MI)
11. Ensure the use of personal protective equipment (PPE) (VHI)
12. Do not remove safety guards from the workplace or equipment (HI)
13. Do not throw or accidentally drop objects from high levels
14. Ensure proper positioning of tasks (VHI)
15. Concentrate on the task at hand (HI)
16. Work in good physical conditions (HI)

From the impact ratings of the factors, findings revealed that 3 of the factors or measurement variables have a very high impact (VHI: 900-10.00), while 9 other factors or measurement variables have high impact (HI: 7.00-8.99) and four other factors or measurement variables have medium impact.

5 Conclusion and Further Research

The purpose of the study was to examine employee's safe acts that contribute to H&S compliance among SMEs contractors. It was concluded from the findings that employee's safe acts have high influence on H&S compliance of SMEs contractors in Ghana. Further research will be conducted using a questionnaire survey instrument to evaluate the validity of the factors or measurement variables among large construction firms.

6 References

Adenuga, O.A., Soyingbe, A.A., and Ajayi, M. A. (2007). A study on selected safety measures on construction Companies in Lagos, Nigeria, *RICS (Cobra).*

Adeogun, B.K. and Okafor, C.C. (2013). Occupational Health, Safety and Environment (HSE) Trends in Nigeria. International Journal of Environmental Sciences, Management and Engineering Research, Vol. 2 (1), pp. 24-29, Jan- Feb. Available from http:// www.ijesmer.com [accessed 02 July 2014].

Boshoff, T. (2015). Health and Safety and the Employment,The South African Labour Guide. Available from http://www.labourguide.co.za/ [accessed 08 October 2015].

Elgood, J., Gilby, N. and Pearson, H. (204). Attitudes towards Health and Safety: A Quantitative Survey of Stakeholder Opinion, MORI Social Research Institute.

Frempong, G. and Essegbey, G. (2006). Towards an African e- Index, SME e-ACCESS AND USAGE across 14 African countries, Available from http://www.researchictafrica.net [accessed 30 September 2014], pp. 25-27.

Hallowell, M.R. and Gambatese J.A. (2010). "Qualitative research: application of the Delphi method to CEM research." Journal of Construction Engineering and Management, ASCE, Vol. 136 (1), pp. 99-107.

Idubor, E.E. and Oisamoj, M.D. (2013). An exploration of health and safety management issues in Nigeria's effort to industrialise. European Scientific Journal April 2013 edition, Vol. 9 (12) ISSN: 1857 – 7881 (Print) e - ISSN 1857- 7431, p.159.

Kheni, N.A, Dainty, A.R.J. and Gibb, A.G.F. (2007). Influence of political and socio-cultural environments on health and safety management within SMEs: a Ghana case study. *In:* Boyd, D (Ed) *Proceedings of the 23rd Annual ARCOM Conference*, 3-5 September 2007, Belfast, UK, Association of Researchers in Construction Management, pp.159-168.

Laryea, S. (2010). Health and safety on construction sites in Ghana: In :The Construction, Building and Real Estate Research Conference of the Royal Institute of Chartered Surveyors, Dauphine Université, Paris, 2-3 September. Dauphine Université, Paris, France. Available from entaur.reading.ac.uk [accessed on 24 February 2015].

Mustapha, Z. Aigbavboa, C. O. and Thwala, W.D. (2015). Application of Modified Statistical Triangle of Accident Causation in Construction Health and Safety, © Springer-Verlag Berlin Heidelberg 2015 L. Shen et al. (eds.), Proceedings of the 19th International Symposium on Advancement of Construction Management and Real Estate, DOI 10.1007/978-3-662-46994-1_6, pp.57-66.

Ofori, G. and Toor, S.R. (2012). *Journal of Construction in Developing Countries*, Leadership and Construction Industry Development in Developing Countries, Available from http://web.usm.my/jcdc [Accessed 20 May 2015].

Schulz, D. (2004). “Employee Attitudes: A must have. Occupational Health and Safety,” Vol. 73(6), pp. 66-71.

Othman, A. A. E. (2012). A study of the causes and effect of contractors’ noncompliance with the health and safety regulations in the South African construction industry. *Architectural Engineering and Design Management,* Vol.8, pp.180-191.

Smallwood, J.J (2010). “Excavation health and safety (H&S): a South African perspective”. *In:* Egbu, C. (Ed) *Procs 26th Annual ARCOM Conference,* 6-8 September 2010, Leeds, UK, Association of Researchers in Construction Management, pp. 233-241.

Smallwood, J. Haupt, T and Shakantu (2008). Construction Health and Safety in South Africa: Status and Recommendation, *CIDB report.*

Windapo, A. and Oladapo, A. (2012). Determinant of construction firms’ compliance with health and safety regulations in South Africa *In*: Smith, S.D (Ed) *Procs 28th Annual ARCOM Conference,* 3-5 September 2012, Edinburgh, UK, Association of Researchers in Construction Management, pp.433-444.